National Security Space Office

National Security Space Enterprise Engineering

Mr. Hal Hagemeier
Operations Manager

Today's World Depends On Space Capabilities

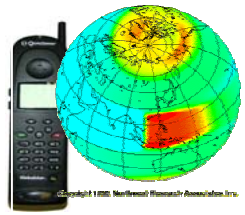
Weather
- Daily Forecasting
- Hurricane Prediction
- Climate Monitoring

Navigation
- Air, Sea, and Land
- Personal GPS
- Surveying

Finance
- Banking Transactions
- Automated Teller Machines

Broadcasting
- Television
- Satellite Radio

Communications
- Satellite Telephony
- Scintillation Forecasts



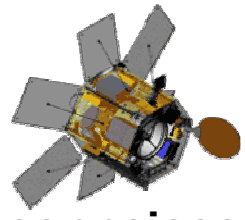
Remote Sensing
- Agriculture
- Mineral (oil/gas/coal /metals)

Science
- Government Research
- Private & University Research

Space Launch
- Large and Small Payloads

Defense and Intelligence Decision Makers Depend On Space

Surveillance & Warning

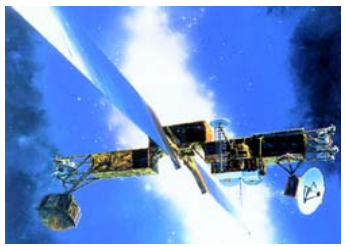


Reconnaissance & Intelligence

Launch

Space Situation Awareness

Positioning, Navigation, & Timing



Communications

Weather

National Security Space Defined

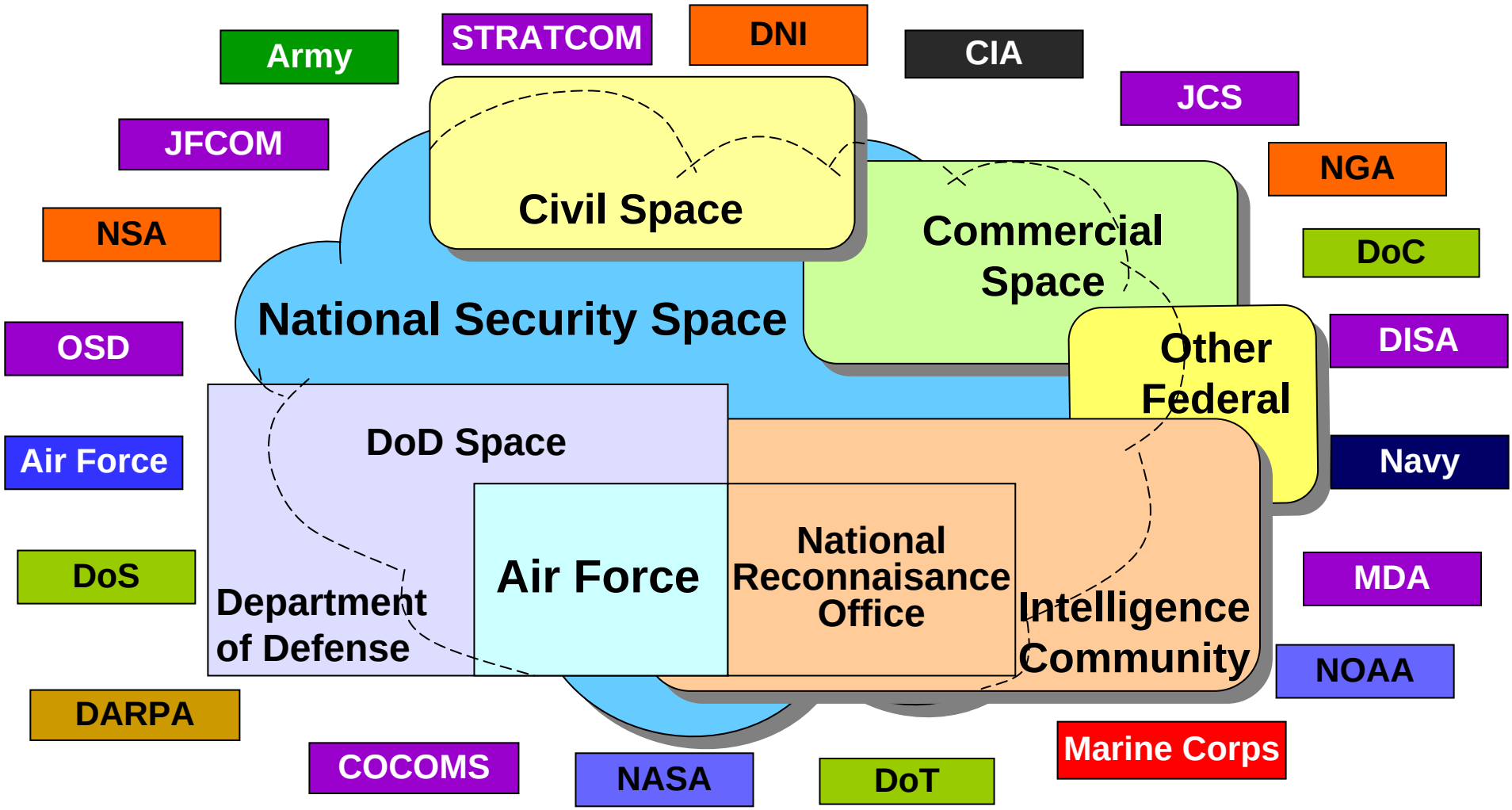
Para III. *National Security Space* Guidelines:

The United States will conduct *those space activities necessary for national security*. These activities will be *overseen by the SecDef and the DCI* consistent with their respective responsibilities as set forth in the Nat Sec Act of 1947….Other departments and agencies will assist as appropriate.

National Space Policy, PDD/NSC-49/NSTC-8

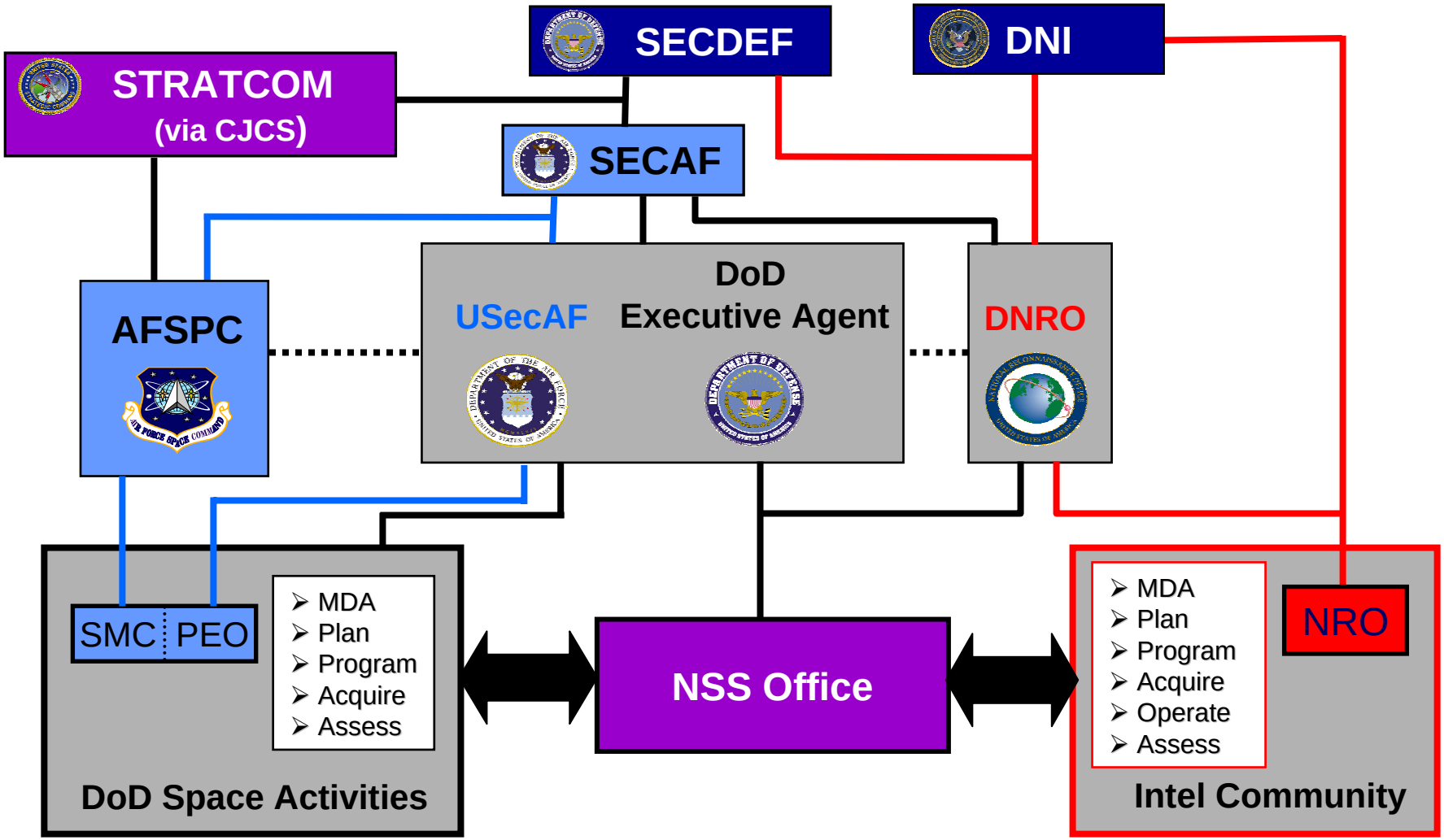
(September 14, 1996)

National Security Space Community



An enterprise consists of people, processes, and technology interacting with each other and their environment to achieve goals

National Security Space Organization

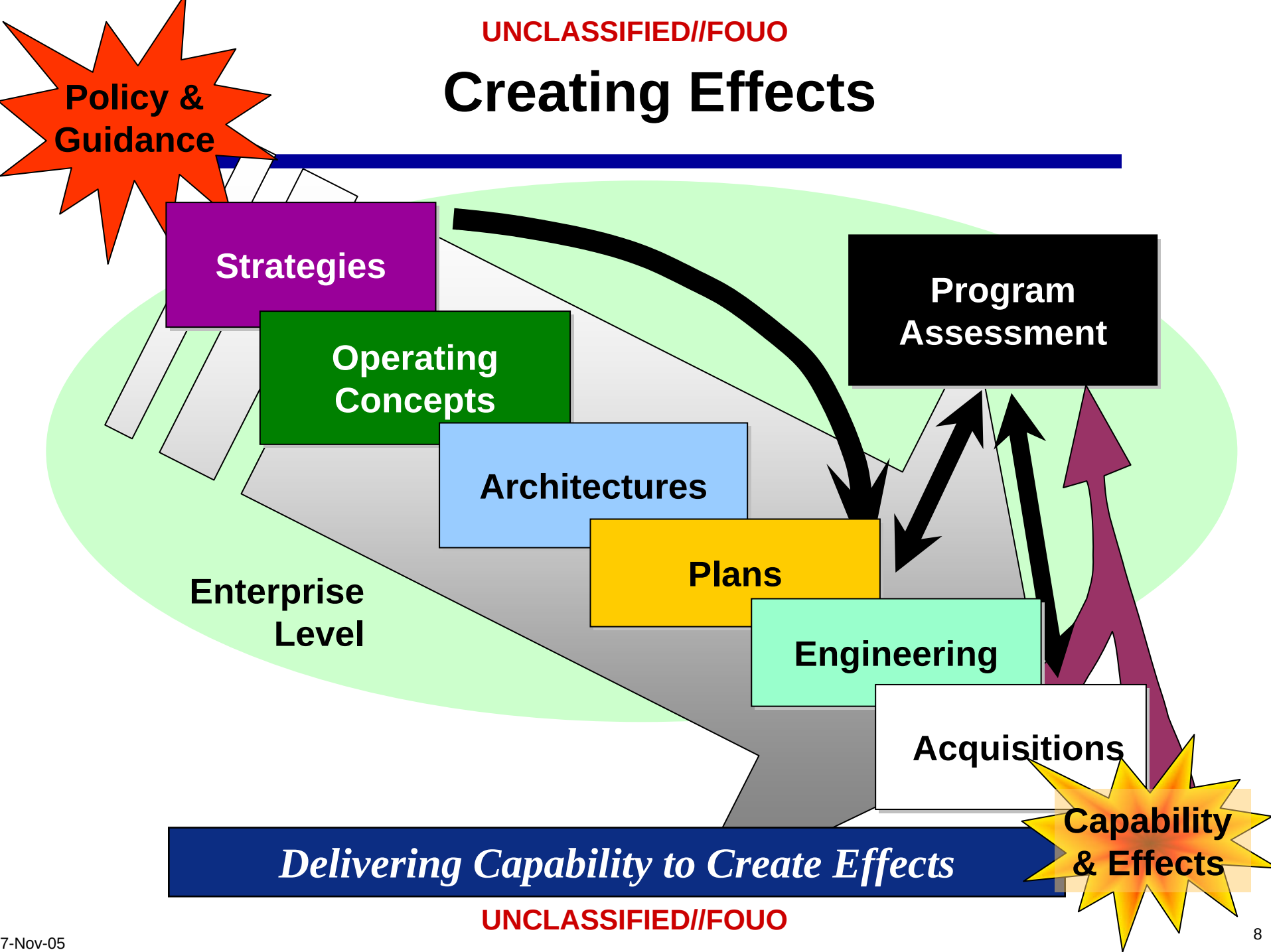


National Security Space Office

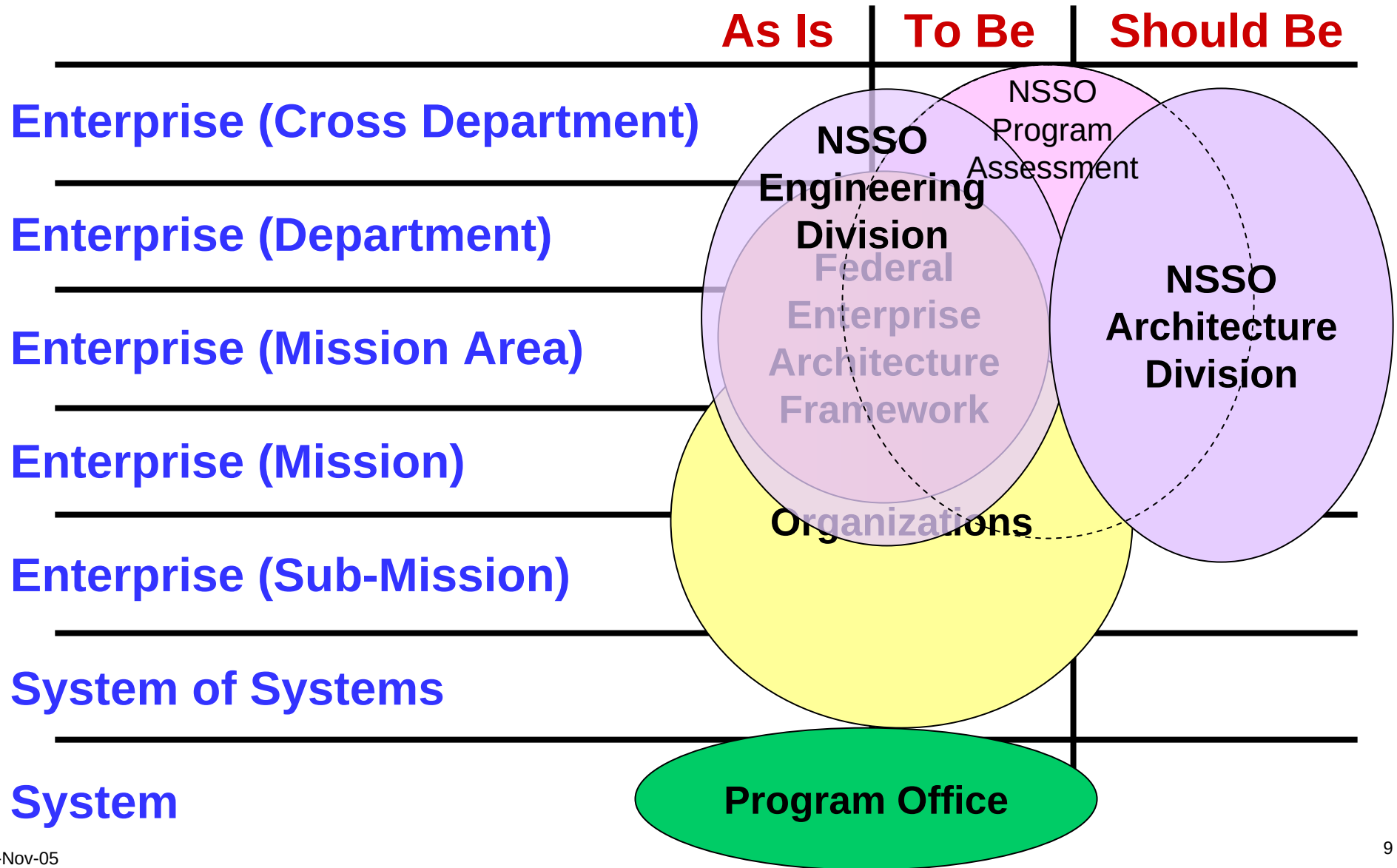
Mission:

Integrate and Coordinate Defense and Intelligence Space Activities to Achieve Unity of Effort

Creating Effects



Taxonomy


As Is
To Be
Should Be
Enterprise (Cross Department)
Enterprise (Department)
Enterprise (Mission Area)
Enterprise (Mission)
Enterprise (Sub-Mission)
System of Systems
System
NSSO Engineering Division
NSSO Program Assessment
NSSO Architecture Division
Federal Enterprise Architecture Framework
Organizations
Program Office

NSSO Architectures

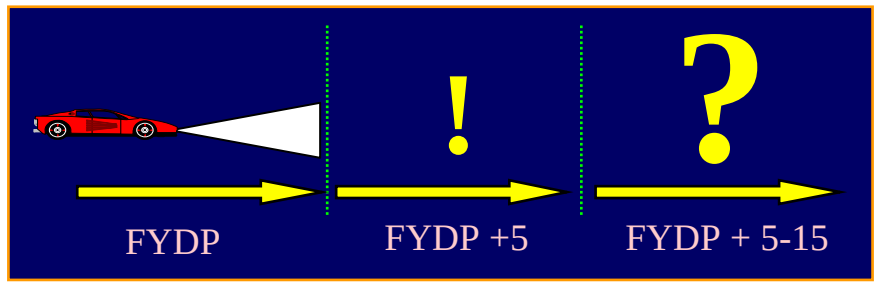
(What They Are & What They Aren't)

- **NSSO Long Range Architectures provide framework and context**
  - Much like city planning
  - Versus designing a specific building
- **Recommendations that guide long term actions**
  - Focus on ultimate destination
  - Versus the next exit & meal stops or what's within range of the headlights
- **Characteristics or objectives that influence decisions**
  - Allows flexibility in moving towards objective
  - Versus specific system implementations

Defines pattern and balance of major elements

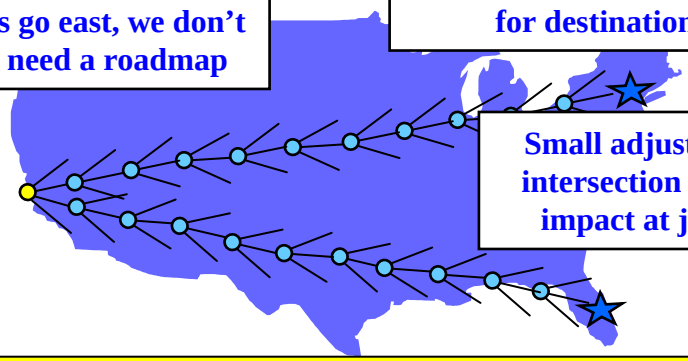
Defines interface relationships

Provides long term framework to guide detailed planning



If all we want to do is go east, we don't need a roadmap

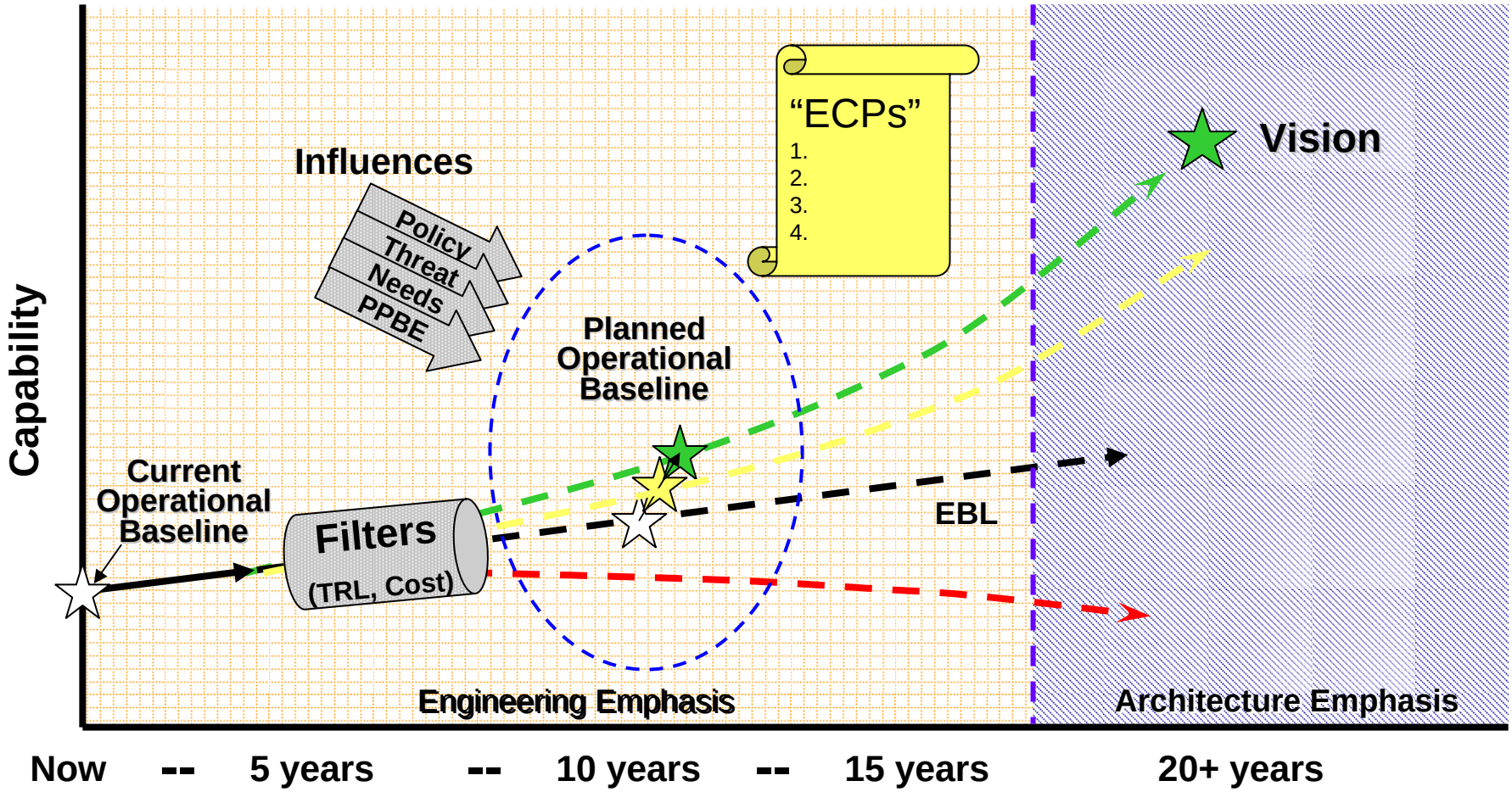
However if we have a preference for destination, then...



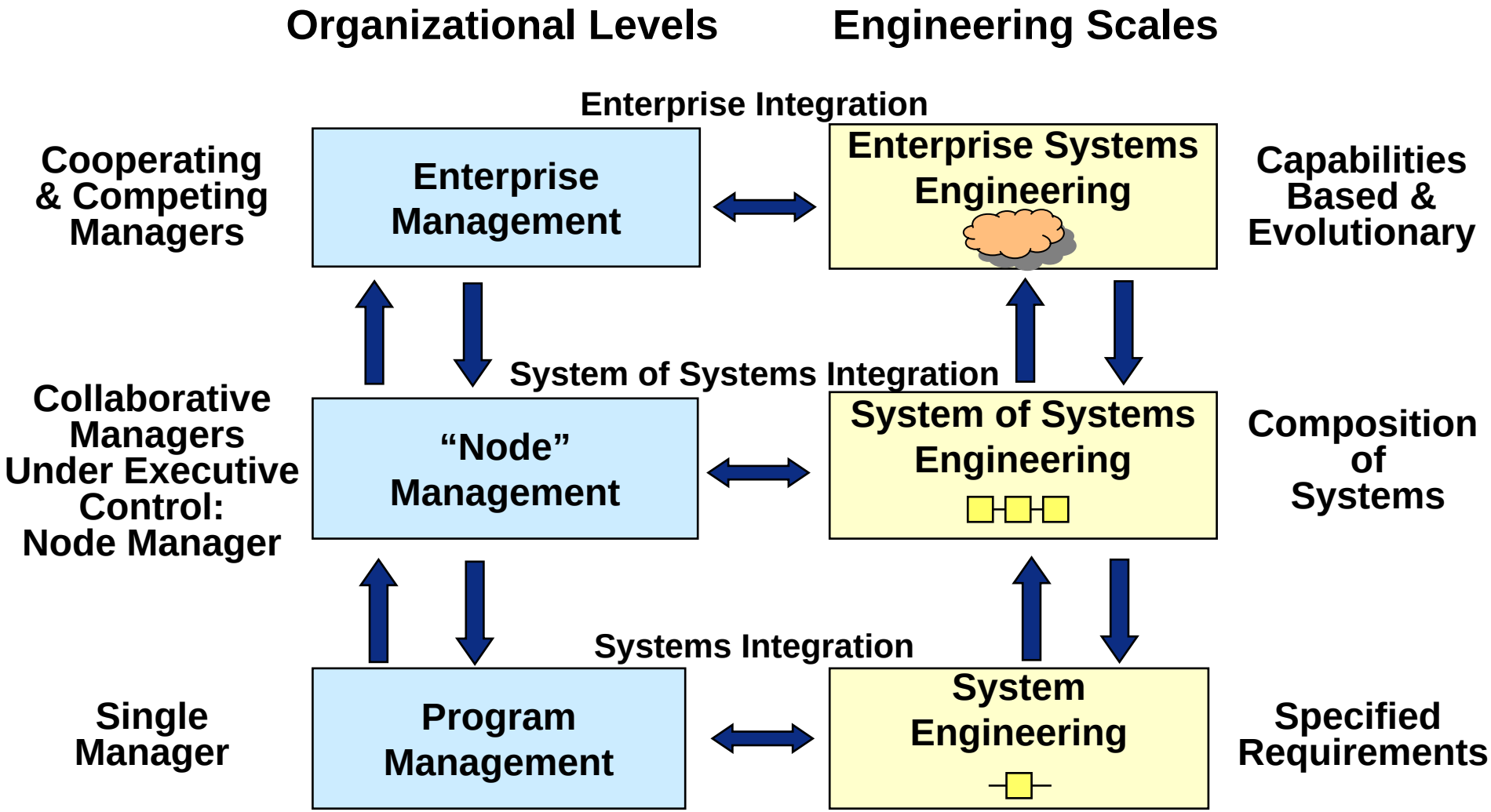
Small adjustments at each intersection can have a big impact at journey's end

NSSO architectures provide framework to guide long range decisions

Enterprise Management

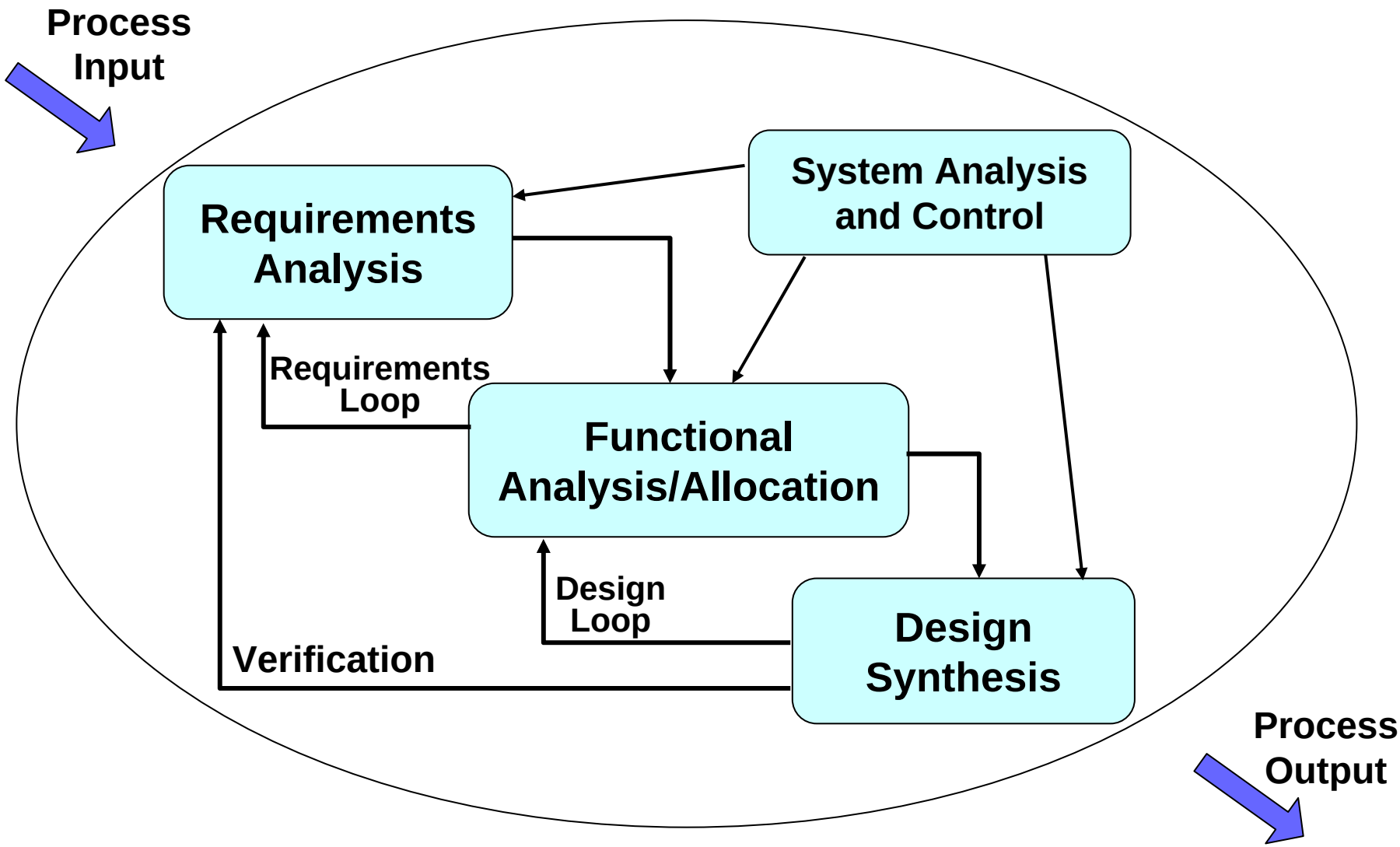


The Three Layer Framework



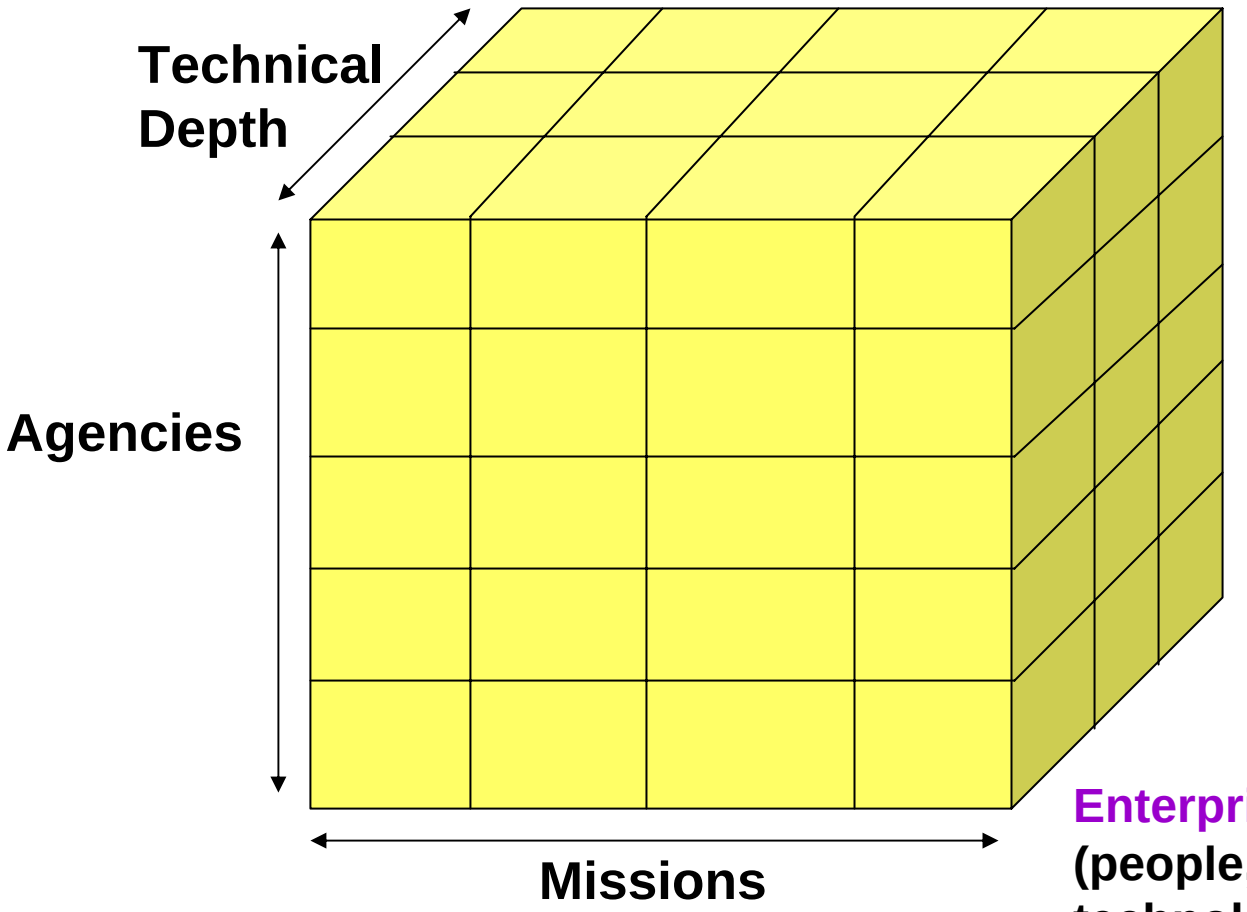
Courtesy of MITRE Corporation

System Engineering Process*



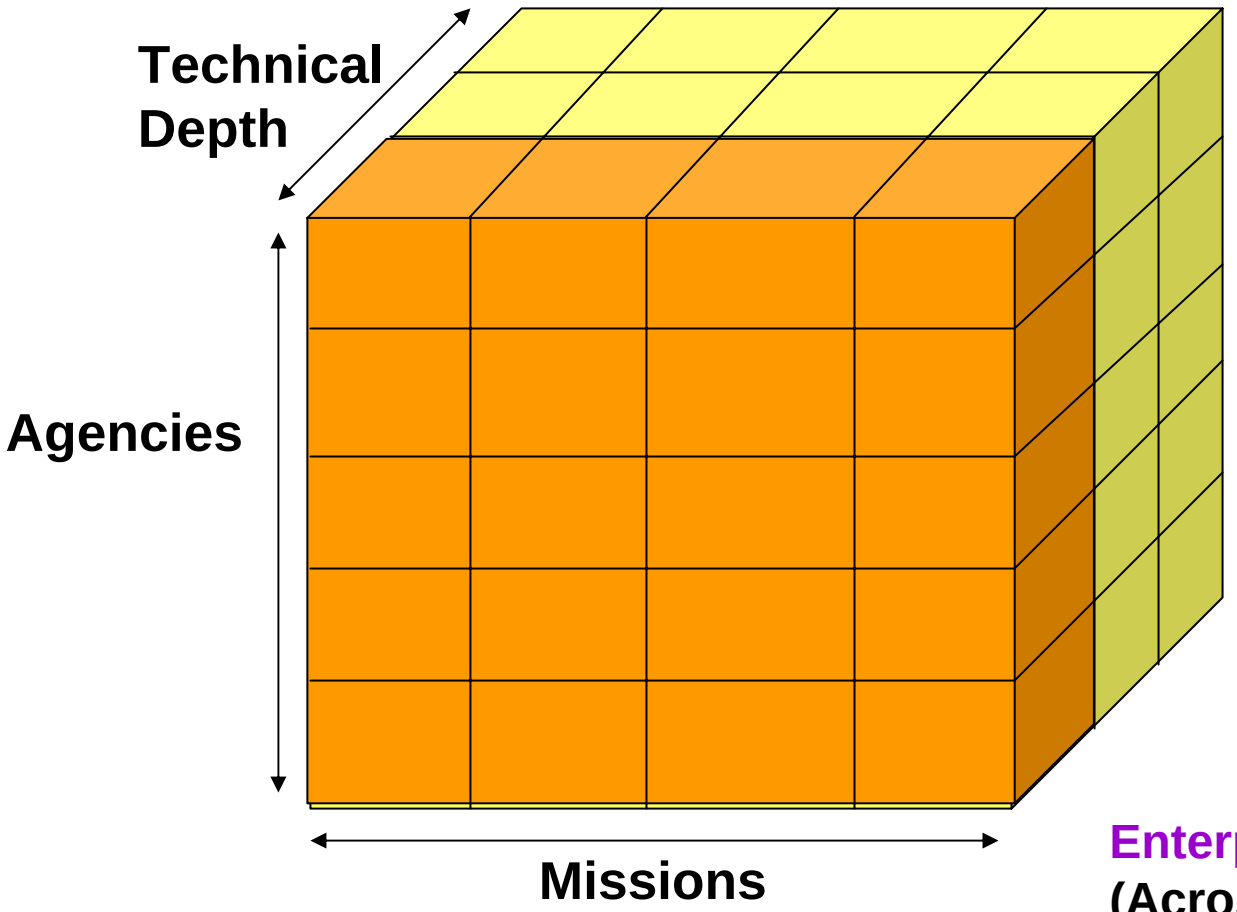
* “Systems Engineering Fundamentals,” Defense Acquisition University

Enterprise Engineering Relationships



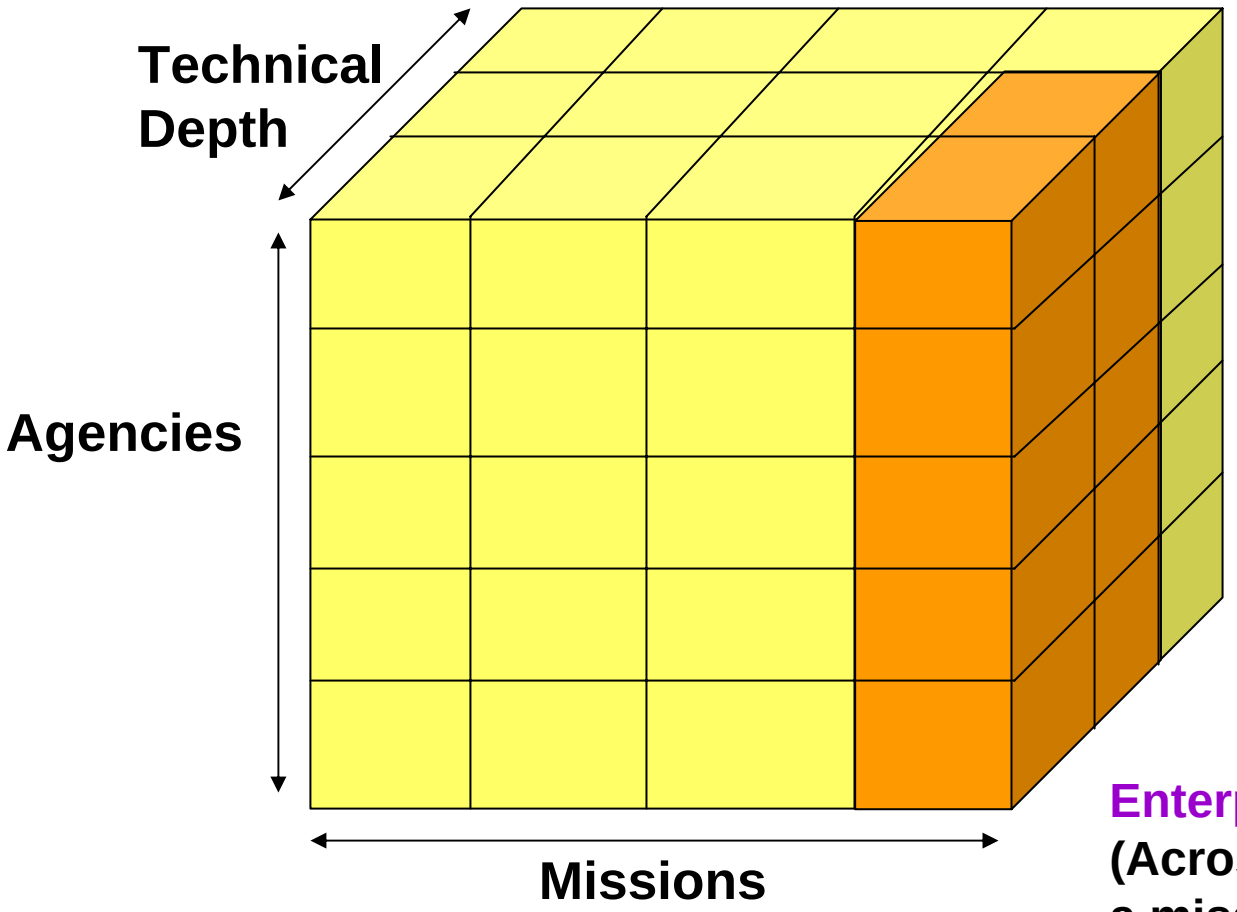
Enterprise
(people, processes, and technology interacting with each other and their environment to achieve goals)

Enterprise Engineering Relationships



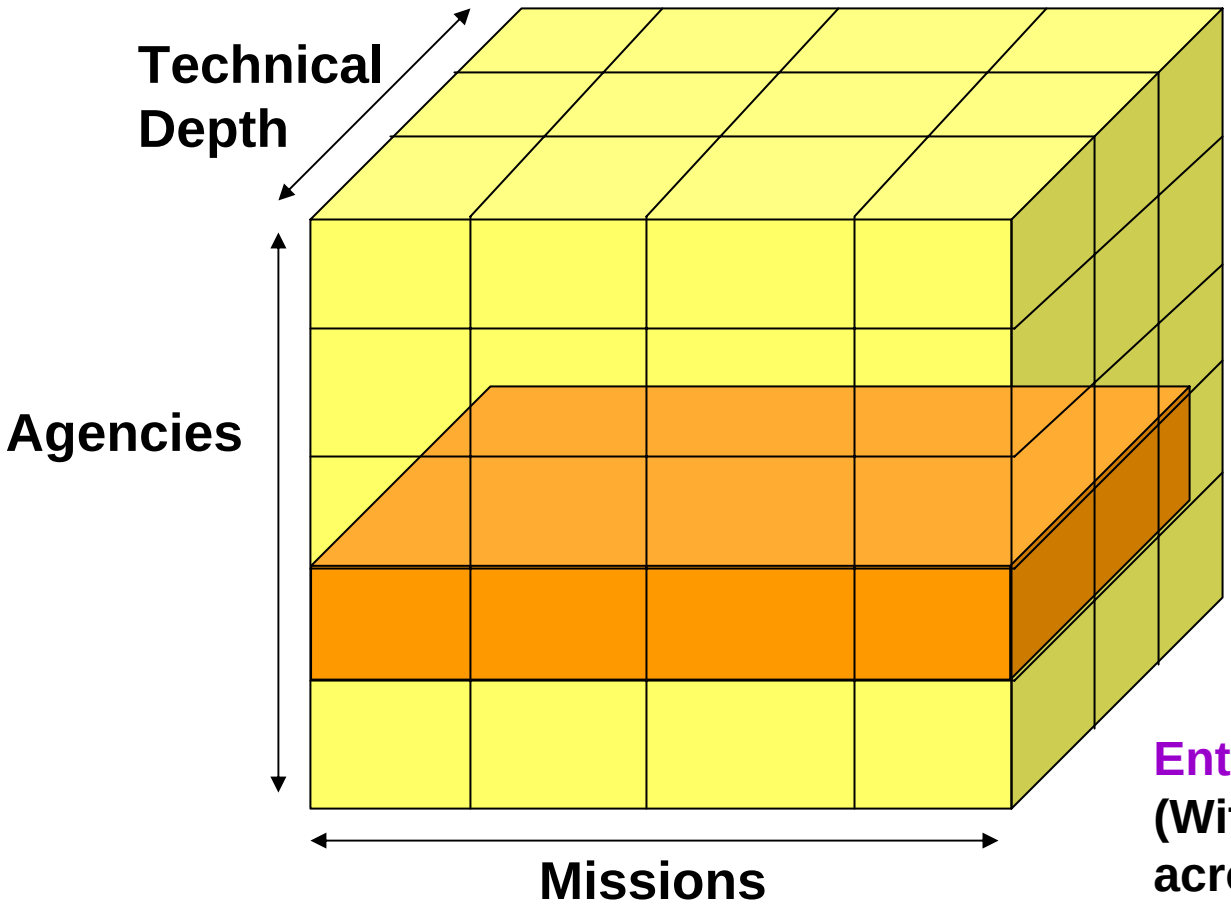
Enterprise Level 1
(Across missions and across agencies)

Enterprise Engineering Relationships



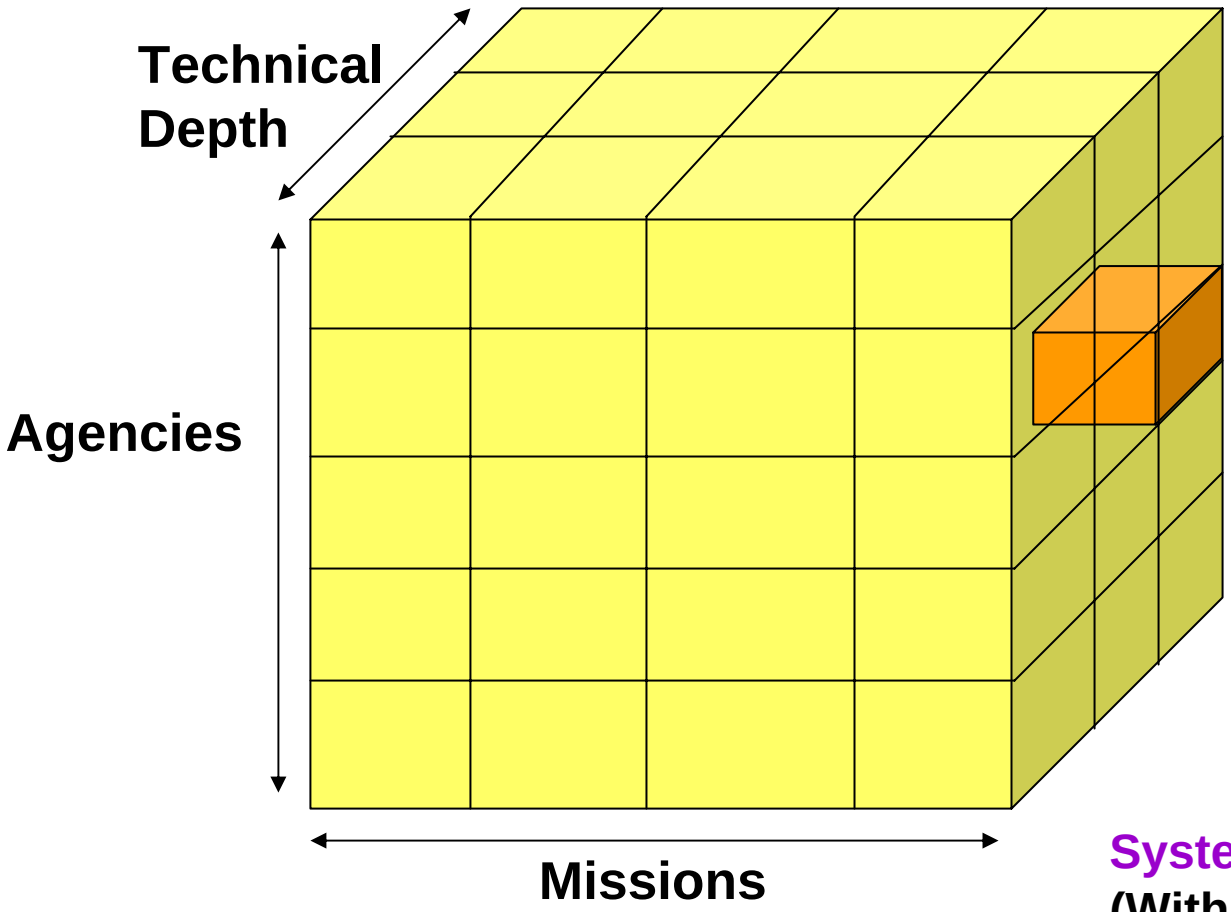
Enterprise Level 2
(Across agencies, but within a mission/function; somewhat more technical depth than level 1)

Enterprise Engineering Relationships



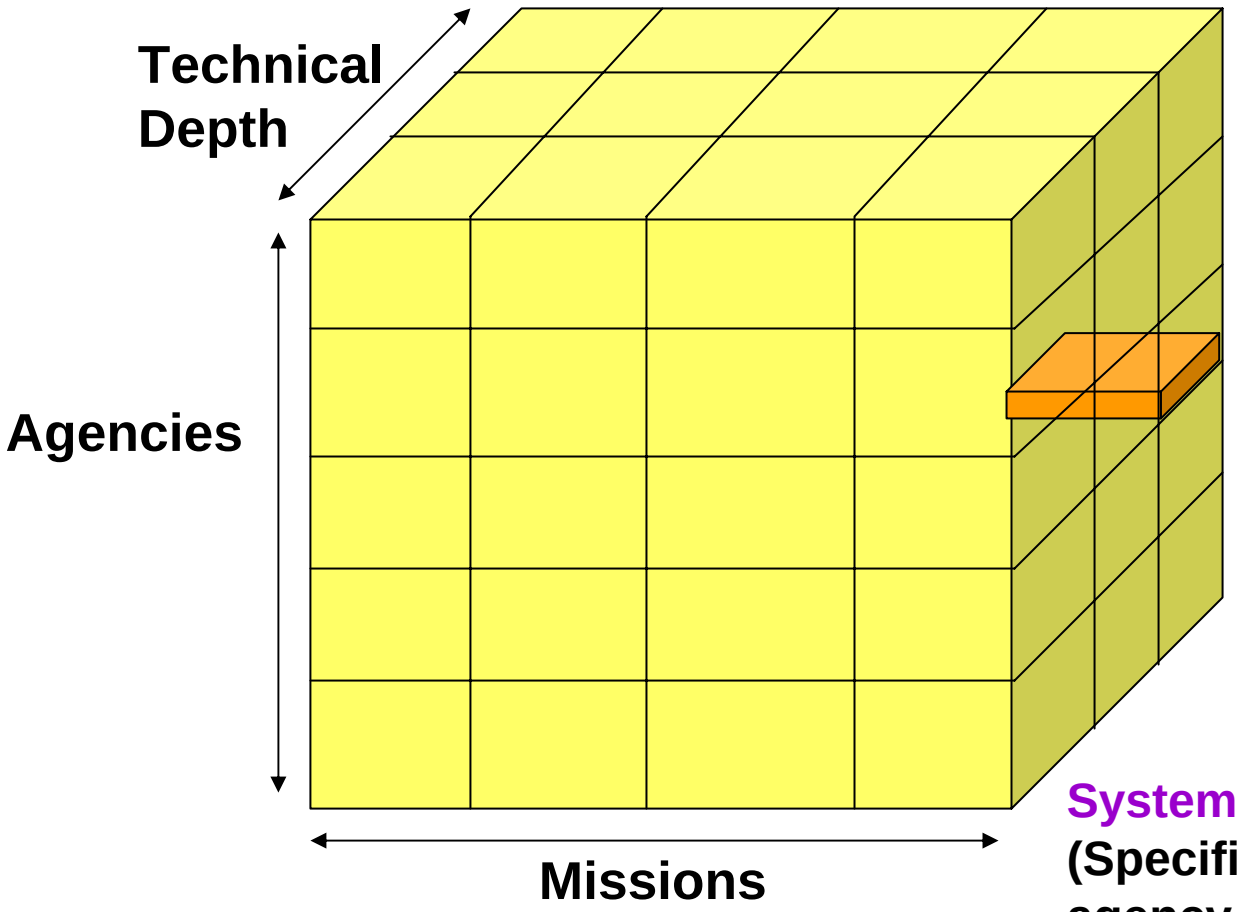
Enterprise Level 3
(Within an agency, but across that agencies' missions/functions; technical depth somewhat more than level 2)

Enterprise Engineering Relationships



System of systems level
(Within an agency, within a mission/function; more technical depth than level 3)

Enterprise Engineering Relationships



System level
(Specific program within an agency, within a mission/ function; more technical depth than any other level)

Enterprise-Level Activities

- **“Should Be” Architectures**
- **“As Is” and “To Be” Architecture Baselines**
- **Relationships across agencies and missions**
- **National Security Space Plan**
- **Integrated Science and Technology roadmaps**
- **Integrated master schedule**
- **Baseline monitoring and advocacy**
- **Best practices assessments**

NSS Acquisition Policy (Dec 04)

- **Systems Engineering**
  - **“Robust SE is essential to the success of any program”**
  - **“Program offices must focus attention on the application of SE principles … throughout the system life cycle”**
  - **“Program offices must elevate these SE principles to a level commensurate with other programmatic considerations such as cost and schedule”**
- **Milestone decision process includes**
  - **SE process review**
  - **SE Plan**
  - **Technology maturity assessment**
  - **Enterprise architectural context**
  - **Test and evaluation approach**
  - **Risk assessment and risk reduction plans (technology, performance, schedule,…)**
  - **Alternatives assessment and trade-offs**

Bottom Line

- **Space provides critical capabilities for all sectors of our society**
- **There is value to addressing national security space from an enterprise perspective**
- **We can be more effective and efficient by appropriate enterprise engineering**

Improving Space Contributions to National Security